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PETITION

BY

THE ST. LAWRENCE POWER COMPANY
LIMITED

TO

His Excellency, The Governor-General
of Canada, in Council

FOR PERMISSION

To Erect the Structures herein described near the
Town of Mille Roches, Ontario.



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HUMBLY SHEWETH:—

PRELIMINARY.

The hydro-electric power development herein described is proposed by the St. Lawrence Power Co., Limited, a Canadian Corporation, working in conjunction with the Long Sault Development Co., an American Corporation.

The St. Lawrence Power Co., Ltd., owns the present power development at the foot of Sheek Island near Mille Roches, Ontario. It takes its water through that branch of the Cornwall Canal on the north side of Sheek Island and furnishes electric power and lights for the Cornwall Canal System, also for Cornwall, Moulinette, Mille Roches and Wales. Its present output is about 1,500 H.P., and it could dispose of much more power by transmission to near-by towns and by locating, in Cornwall and vicinity, new industries which would be attracted to this otherwise favorable manufacturing district, could they be assured of getting substantial amounts of power at reasonable rates.

When the present owners of the St. Lawrence Power Co., Ltd. secured possession, they did so under the impression that its power could be greatly increased at a reasonable cost, by excavating a canal 18,500 feet in length, along Hoopes Creek, or by enlarging the Cornwall Canal from its upper end, above lock 21, down to the western end of Sheek Island, a distance of 12,500 feet. Investigation has shown both of these plans to be entirely impracticable from a commercial standpoint. The ultimate capacity of the plant, if fully equipped with machinery, is limited to about 3,000 H.P. of continuous power, available throughout the year and 2,300 H.P. of excess power, available only about 10 months in the year; the annual backwater conditions in the winter reduce the capacity as above indicated.

The Long Sault Development Co. has a charter from New York State authorizing the construction of a power house in the South Sault Channel at the foot of Long Sault Island. The location of this plant is shown on Plan No. 1. This power house will be located entirely in American territory.

The St. Lawrence Power Co., Ltd., and the Long Sault Development Co., by conjointly developing the power available from the Long Sault Rapids, will each be able to secure ultimate results that are not possible for either Company to accomplish by working alone, or independent of the other. They will supply power to all industries in the surrounding country. The proposed development will also attract many new, important industries into the territory adjacent to Cornwall.

A general outline of the plan is as follows:—

AMERICAN POWER HOUSE AND LOCK.

The Long Sault Development Co. proposes to construct a power house and lock across the South Sault Channel, between the foot of Long Sault Island and the main shore, as shown on plan No. 1. Permission has already been granted by the New York State Legislature authorizing this construction, and such further construction, so far as it lies in American territory.

DAMS.

A dam, for convenience called the "Upper Dam," is proposed between the upper end of Barnhart Island and the lower end of Long Sault Island. It will have a spillway about 3,700 feet long and at each end, next to the

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shore there will be located a number of Stoney type sluice gates, the combined discharge of which will be about 100,000 second-feet.

Another dam, called the "Lower Dam," is proposed between the lower end of Barnhart Island and the Canadian shore; it will be "V" shaped for the purpose of obtaining a spillway 4,150 feet long, and will lie on both sides of the International Boundary Line, as shown on plan No. 1.

CANADIAN POWER HOUSE.

At the nor'-easterly end of the Lower Dam it is proposed to construct a large power house, between the dam and the Canadian shore immediately above lock 20. The power house will be entirely in Canadian territory, and will be large enough to supply all requirements for power in this vicinity.

POWER HOUSE ON BARNHART ISLAND.

At the eastern end of Barnhart Island it is proposed to construct one, or possibly two, power houses located approximately as shown on the plan, and to excavate a head race leading from the pond immediately above the Lower Dam to these power houses.

TYPE OF DAMS AND FOUNDATIONS.

It is proposed to make both dams of solid masonry; they will be of the gravity type and will be built unusually massive and strong. Examination has shown that all structures will rest on a solid limestone ledge.

Open test pits 10 feet square were sunk to the ledge on each side of the South Sault channel at the proposed site of the American lock and power house. Diamond drill borings were then made to a depth of 30 feet while numerous 6" churn drill borings were made to a depth of forty feet, thus proving sufficient thickness of the ledge at this point. Near the west end of the Upper Dam site, on Long Sault Island, the ledge is visible at the surface of the ground. The existence of the Long Sault rapids proves the location of this ledge along the entire site of the Upper Dam, while the power houses near the foot of Barnhart Island will rest on this same ledge of limestone. The location of these power houses, shown Plan no No. 1, is approximately that which would be desirable from the

standpoint of economical construction; however if final examination makes it advisable, this location will be changed to meet local conditions and requirements.

Drilling operations are now under way for securing this information.

CONTROLLING WORKS.

In addition to the sluiceways at the Upper Dam there will be constructed at each of the power houses a number of large Stoney type sluice gates to control the elevation of the pond and to handle ice in winter.

These gates will be from 35 to 50 feet in width with about 15 feet depth of water on the sills, and they will be designed for operation throughout the entire year; they will be made as strong and substantial as possible.

WORKS TO BE CONSTRUCTED UNDER GOVERNMENT APPROVAL.

It is proposed to have the Engineering Departments of both Governments approve the plans for the works that are to be constructed in the respective countries.

X The financial success of this entire development, costing many million dollars, is contingent on maintaining the absolute integrity of all dams, power houses and their controlling works. Any failure of these structures would cause great financial loss to the owners; consequently as a matter of self protection and insurance, unusually high factors of safety will be adopted throughout, so that nothing short of an earthquake could wreck them.

In view of the above, when one bears in mind the solid ledge of rock that will afford excellent foundations, and the very generous expenditure of money that will be made to secure unusual stability and absolute safety for the proposed structures, the feasibility of the entire scheme, as a work of construction, is apparent.

LOCATION OF MAIN CHANNEL OF RIVER WITH RESPECT TO THE INTERNATIONAL BOUNDARY LINE.

Attention is called to the relative location of Long Sault, Sheek, and Barnhart Islands, also the International Boundary Line, with the main channel of the St. Lawrence River first in International waters on the northerly side of Long Sault Island, while but a short distance below the rapids, which are principally between Long Sault and Sheek Islands,

the main channel of the river lies south of Barnhart Island and entirely within American territory.

The Little River forms the International channel between Barnhart and Sheek Islands.

ADDITIONAL CONSTRUCTION PROPOSED.

The channel of Little River will be widened to about 800 feet at its narrowest point and the depth will be correspondingly increased; this will afford a wide, deep canal connecting the Upper and Lower Ponds.

The earthen dams that are now located at the east and west ends of Sheek Island on the south side of the Cornwall canal will be dredged out; this will provide an additional canal of large cross sectional area connecting the Upper and Lower Ponds. This change will not be made until the stability of all structures has been satisfactorily proved.

The water in these canals will be raised to Elevation 205, sea level datum; this will allow a fall of about 8 feet 2 inches in the river level, between the eastern end of the Morrisburg Canal and the Dams. At the upper end of the Cornwall Canal, the backwater rise will amount to less than 5 feet, and it will largely cease in the swift rapids opposite Farran's Point. Upstream from these rapids, the rise will continually diminish, and will be so small as to be hardly noticeable in comparison with the present frequent fluctuations of river level, due to wind and varying cycles of rainfall. The backwater effect will substantially disappear before Morrisburg is reached. The above will enable lock 21 in the present Cornwall Canal System to be discontinued, and will also reduce the velocity of the current in the river above and below Farran's Point. Any reduction in the velocity of the current at this Point will be of great assistance in the navigation of boats up stream. At present, the current is so strong on the north side of Croil Island that the boats frequently go through the Big Sny, thence passing up the channel on the south side of Croil Island, in American waters.

When the water is raised 5 feet above the present level at lock 20 it will necessitate the construction of a new lock about 2,600 feet west of lock 20, and also a dike as shown on plan No. 1. This new lock can be constructed entirely "in the dry," at the point shown, without interfering in any way with navigation. It will be designed and constructed subject to the approval of the Canadian Government, and will be built entirely at the expense of the St. Lawrence Power Co., Ltd.

The dike will consist of an earth embankment having a top width of about 100 feet, to be constructed entirely free of cost to the Govern-

ment, but subject to its approval, and under its direction. The head of water against the dike will be approximately 5 feet.

The construction of this dike and lock as above described, will cause to be abandoned about 4,000 feet of the present Cornwall Canal, extending from the site of the new lock to a point about 1,000 feet above the swing bridge which crosses the canal near the eastern end of Sheek Island.

BENEFITS TO NAVIGATION.

The effect of these changes will be decided and positive benefits to navigation. They are as follows:—

A boat going upstream, having passed lock 20, will then enter the new lock which will have a lift of 5 feet. Having passed through this lock, there will then be a practically straight channel at least 800 feet wide, with a minimum depth of 20 feet, extending directly upstream to a point considerably above the upper end of Croil Island. Owing to the size of this channel, boats will be able to make the passage against a much slower current than under present conditions and at full speed. At present boats are legally required to reduce speed to four miles per hour in the narrow sections of the Cornwall Canal; this is so much slower than they will be able to go, on leaving the new lock, that much time will be saved under the proposed conditions.

The distance between lock 20 and the upper end of Croil Island via the new route will be reduced about one mile. This reduction of distance will shorten the time of transit somewhat, but the principal reduction in the time will be by using the Little River channel and the main river on the north side of Long Sault Island instead of following the circuitous route of the present Cornwall Canal above lock 20, thence around the north side of Sheek Island, along the narrow curved canal and past lock 21. The above arrangement will not reduce the number of locks in the canal, but will shorten the time required for passage.

When the new lock is built the Canadian Government can, at any time in the future, construct a single lift lock near the site of lock 20, and excavate a short canal entering the river below Barnhart Island, and thus reduce the length of the Cornwall Canal from eleven to about two miles, and the number of locks from six to two.

The dams and other changes proposed by the St. Lawrence Power Co., Ltd., will thus enable a great improvement to be made in the Corn-

wall canal below the proposed new lock, at a cost of several hundred thousand dollars less than would otherwise be the case.

On the American side at the foot of Long Sault Island, will be constructed a single lock that will accomplish in one lockage the entire lift now made by six locks in the Cornwall Canal System. Under the proposed arrangement of dams, the velocity of the water in the main channel of the river south of Barnhart Island will be reduced so much that boats can readily pass up stream against the current. A boat using the American lock, instead of the Cornwall Canal will save at least four hours on a round trip. This will be of great benefit to the freighters whose profits vary almost directly as the number of trips they make.

EFFECT OF PROPOSED CHANGES RE BOATS SHOOTING THE LONG SAULT.

The Long Sault Rapids are navigated by only two passenger boats which are owned by the Richelieu & Ontario Navigation Co. These steamers make only one trip per day, down stream, during the summer tourist season, a period of less than four months. No rafts or other craft of any kind use the main channel on the north side of lower Long Sault Island, and no boats whatever can go up this channel. Under the proposed conditions there will be a broad, navigable channel, at and above the site of the present Long Sault Rapids, that can be used by ALL of the boats on the river, in BOTH directions whereas under the present conditions there is no navigation at all in the strict sense of the word, save for this single line of passenger boats making one trip per day for a period less than four months in the year.

At the public hearing in Montreal, Nov. 6, 1907, the Richelieu & Ontario Navigation Co. raised an objection to the construction of these dams, maintaining that "the Long Sault, being one of the chain of rapids, is one of the principal assets of this Company" and that the obliteration of these rapids would greatly decrease the number of tourist passengers on their boats.

So far as the sight-seeing is concerned, it would seem that instead of the construction of these dams, with the consequent obliteration of the Long Sault Rapids, being a debit to the Richelieu & Ontario Navigation Co.'s so called "assets," the opportunity for tourists passing through the highest lift lock on the American continent and then seeing

a dam, 3,700 feet long, with water several feet deep passing over its crest in an unbroken sheet, and falling about forty feet, would more than offset the loss occasioned by their not being able to shoot the Long Sault Rapids which are probably less picturesque and thrilling than the other three rapids to be found between this point and Montreal.

In view of the great benefits that will result to shipping interests in general, including the Richelieu & Ontario Navigation Co's. freighters, and also to the communities and towns within the radius of transmission of the power from this development, and also in view of the fact that a suitable lock will be provided on the American side where all boats can save approximately four hours time in a round trip, it would seem that there should be no doubt in the mind of any one that the Richelieu & Ontario Navigation Co's. passenger business will share equally, with all of these other varied interests, in the direct and positive benefits that will follow the construction of the proposed works.

CONTOUR SURVEYS ALONG RIVER.

The engineers of the St. Lawrence Power Co., Ltd. have completed accurate surveys of the entire river from the lower end of Barnhart Island to Waddington, a distance of about 23 miles. These surveys show all of the contours, at 2½ feet intervals, also the property lines on the Islands and the main shores, to a point above Croil Island; between this latter point and Waddington the contours and property lines were only surveyed to elevation on 215, sea level datum. These maps, so far as they have been worked up, are submitted herewith on plans number 2 to 10, and from them can be determined all questions that will be involved when the pond is raised to the proposed level. These surveys cover over ninety square miles of the territory and required the services of about 65 men for a period of nearly eight months. The cost of these surveys was over \$35,000.

The St. Lawrence Power Co. Ltd. has already acquired much land and many riparian rights that will be affected by the proposed changes, while negotiations are under way for securing the remainder.

The Long Sault Development Co. on the American side, has acquired practically all of Barnhart Island and the lower half of Long Sault Island, together with riparian rights entirely around the upper end of the island, also nearly 2,000 acres of land on the main shore extending from a point opposite the lower end of Barnhart Island, upstream to the Massena canal,

a distance of about 8 miles. Both companies are acquiring land on their respective sides of the river to Elevation 215, sea level datum, which will be 10 feet above the proposed pond level; they are also securing riparian rights along all of the streams that flow into the St. Lawrence river, where there is any possibility of riparian damage being claimed, by reason of backwater.

Mention of the above is made to illustrate to what extent the two Companies have gone thus far in the line of acquiring property, riparian rights, easements, etc. in connection with the proposed development and to show that these Companies are negotiating a bona fide power development, and are not seeking to secure certain franchises, rights, etc. for the purpose of disposing of them to others at a profit. The total expenditure incurred by the St. Lawrence Power Company, Limited, on the scheme to date has been approximately \$1,000,000.

IMPROVEMENTS IN ICE CONDITIONS AT CORNWALL.

It is a well known fact that the greater part of the frazil-ice in this section of the river is formed in the open stretches of water above the Long Sault, as well as the rapids themselves.

The construction of the proposed dams will create a comparatively quiet pond in the river extending upstream to a point above Croil Island. This pond will freeze over to a great extent, while the Long Sault rapids will be entirely obliterated. The result will be a great reduction in the amount of frazil-ice that will be formed.

Under the present conditions the enormous masses of frazil-ice that are formed in and above the rapids, pass down stream until they reach the quiet water at the head of Lake St. Francis; here they form hanging dams on the under side of the sheet-ice on the lake.

Every winter these hanging dams create a flood of backwater that rises from 15 to 30 feet above the normal summer level of the water in the river, endangering the town of Cornwall. In the year 1887 the backwater flooded the town as far as Fifth Street so that practically two thirds of the town was under water.

It is not claimed that the danger of winter flood and backwater at Cornwall will be entirely removed by the proposed dam, but the assertion is made that the danger arising from the annual ice jam will be very much lessened.

Decreasing the danger of flood at Cornwall is not of great interest to people in other parts of the Province; it is, however, of vital importance to the people in Cornwall, and the results that will be accomplished by the construction of the proposed dams are welcomed by the Cornwall inhabitants.

SUMMARY OF ADVANTAGES.

The advantages accruing to the general public from these changes will be:—

(A) Navigation will be possible in the broad main channel of the St. Lawrence River on the north side of Long Sault Island, where the present impassable rapids are located.

(B) Backwater will extend to a point above Croil Island, so that it will very materially lessen the velocity of the current in the channel of the river on the north side of this island, thus enabling boats to readily pass upstream.

(C) The present Cornwall Canal will be shortened about 5 miles, and instead of a narrow channel, where boats are limited to a speed of 4 miles per hour, they will be able to run at full speed, in a channel at least 800 feet wide.

(D) In case it is desirable to run the boats north of Sheek Island, it can be done much more readily under the proposed conditions, than under the present ones, since the channel will be wider and deeper.

(E) A single lift lock at the foot of Long Sault Island will enable boats to make the same lift as is now required by six locks in the present Cornwall Canal system.

(F) The use of the single lift lock will save about four hours time on a round trip of the boats, as compared to the time now required for the passage through the present Cornwall Canal.

(G) The improvement of the channel for navigation purposes, at no cost to the Canadian Government, could not be secured otherwise than by the expenditure by the Government of several million dollars.

(H) When the St. Lawrence Power Co., Limited, has constructed the new lock just above lock 20 and has created a pond at an elevation sufficient to surmount all rapids, the way is prepared for the Government to then construct a new single lift lock a short distance below present lock 20, that will take the place of 5 locks in the Cornwall Canal; and a short

canal from this new lock 20 to the river will reduce the total length of the Cornwall Canal to less than two miles.

(I) The construction of the power plant in Canada will assure manufacturers, within a radius of many miles, abundant and cheap power, and this in turn will develop a purely farming country into large manufacturing centers.

(J) The construction of the dams will greatly lessen the danger arising from the annual ice gorges and floods at the town of Cornwall.

(K) The construction of the proposed works will involve the expenditure of more than \$5,000,000 in Canada, for the Canadian portion of the proposed development alone.

(L) The construction of the power house and lock across the South Sault channel will create a wide and deep canal extending to the upper end of Long Sault Island, so that boats will be able to pass to the upper end of Croil Island and thence into the main channel of the river under most favorable conditions, and under full headway.

**FORMAL REQUEST FOR PERMISSION FROM THE CANADIAN
GOVERNMENT TO CONSTRUCT THE ABOVE DESCRIBED
WORKS.**

The St. Lawrence Power Co., Limited, asks permission from the Canadian Government as follows:--

(A) To construct a solid masonry dam from a point near the Canadian main shore, about opposite lock 20, extending to the International Boundary Line, there to join a dam to be constructed in connection with the works above described, in American territory.

(B) To construct a power house between the north-easterly end of this dam and the Canadian shore, together with a new lock about 2,600 feet west of present lock 20, and an earthen dike, having a top width of about 100 feet, between this power house and lock; also a similar earthen dike extending from this lock northwesterly and parallel to the present canal, and connecting with the main shore at Mille Roches.

(C) To enlarge the present channel of Little River as above set forth, to a minimum width of about 800 feet, and to raise the level of the pond above the dams to an elevation five feet higher than the present level of the Cornwall Canal above lock 20.

(D) After the stability of all of the above described works has been satisfactorily proved, to remove the two earthen dams, at the easterly and westerly ends of Sheek Island and to enlarge the present channel on the north side of Sheek Island.

And your petitioners as in duty bound will ever pray.

Respectfully submitted,

THE ST. LAWRENCE POWER COMPANY, LIMITED,

MONTREAL, 7th December, 1907.

President.